



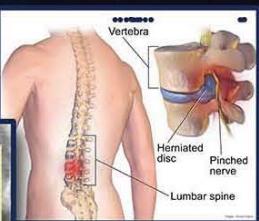
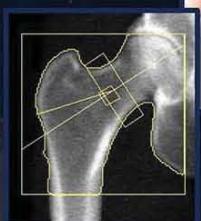
To Mars and Beyond: How Will We Preserve the Musculoskeletal System in Long-term Space Flights?

National Aeronautics and
Space Administration



Concerns

- Bone fracture
- Intervertebral disc damage
- Renal stone formation



Challenges

- Expand knowledge beyond measuring for bone mineral density
- Determine critical factors
 - Exercise
 - Nutrition
 - Radiation
- Develop probabilistic fracture risk assessments
- Expand understanding of fracture healing in microgravity



Research Venues

- Industry
- ISS National Laboratory
- NASA
- National Institutes of Health

